LABORATORY EXERCISE 16:
Internal Structure of Insects: Alimentary Tract

Select a freshly-killed specimen of *Gromphadorhina*, *Blaberus* or *Periplaneta*. With luck and skill, dissection of several organ systems will be performed on this one cockroach specimen, so throughout your studies of the digestive tract take exceptional care not to damage the insect unnecessarily. Partially dissected roaches will be kept in a special preservative of ethanol and glacial acetic acid (if available), to aid preservation of the nervous system.

Cut off the legs and wings of the roach close to the body (save these appendages for future muscle dissections!) and then place the specimen, dorsal side up, in a dissecting dish. Fasten the specimen to the wax through the sides of the pronotal disc. Insert the scissors beneath the posterior edge of the seventh (approximately) abdominal tergite, about half way or 3/4 of the way between the mid-dorsal line of the insect and the sides of the body; cut the terga forward on each side of the body, being careful not to injure the organs beneath. Cut as far as the posterior margin of the metathorax. Lift the terga with forceps, carefully severing any adhering tissue or organs as you work your way toward the anterior end of the abdomen. Then remove the tracheae, muscles, fat body, and assorted 'debris' so as to expose the alimentary canal, including esophagus, crop, gizzard (proventriculus), midgut caeca, midgut, Malpighian tubules, cardiac and pyloric sphincters, ileum and rectum of hindgut, etc. When you have cleared the extraneous parts from the abdomen, remove the broad prothoracic notum by inserting a scalpel or razor between it and the rest of the thorax, cutting as close to the notum as possible. Cut the other thoracic terga as you did the abdominal ones, and remove enough of the thoracic muscles and tracheae to expose the front end of the alimentary canal. Try to find the salivary glands (labial glands) and their large, membranous reservoirs. Cut across the canal with scissors at the most anterior part of the pharynx that you can reach. Also cut back from the 8th abdominal tergum and free the posterior part of the canal just anterior to the anus. Carefully remove the whole digestive tract and place it in your dish -- the rest of the carcass may be removed and placed in preservative at this point. Stretch out the alimentary canal and hold it in position with pins. Make a drawing (**Drawing #29**) of the entire tract, labeling the parts as above and in figures 26-A (Imms) or 3-1 (Romoser); see also fig. 16.1 in Gillott.

After you have finished your drawing, the gizzard may be slit open to show the internal cuticular teeth.

The histology of the digestive tract will be studied in the next laboratory exercise.